



Algebra & Functions (Maths 201–016)

(Marks)

Show your work—**justify** all your answers. Just having the correct answer is not sufficient.

Pace yourself—a rough guide is to spend not more than 2m or 3m minutes on a question worth m marks.

(8 × 2) 1. Evaluate the following expressions:

(a) $6 - 4 \times 3 + 9$

(b) 125% of 40

(c) $\frac{4(8 - 5)}{7 - (1 + 2)}$

(d) $\frac{4}{7} \div \frac{8}{21}$

(e) $(5 - |38 - 2^3 \cdot 5|) - 10$

(f) $\frac{7}{6} - \frac{5}{18}$

(g) $\left(\frac{1}{5} \times 15\right) \left(\frac{1}{5} \times 30\right)$

(h) $\frac{3}{2} \div \left(\frac{5}{6} + \frac{8}{3}\right) \times \frac{14}{5}$

(5 × 3) 2. Expand and simplify the following algebraic expressions:

(a) $(5x - 3)^2$

(b) $(5x + 3)(5x - 3)$

(c) $(3 - 4x)^2 - 9$

(d) $3x(4x - 1) - 2(4x - 1)(x + 4)$

(e) $(2x - 5)^2 - (5x - 2) + x(x - 3)$

(3 × 3) 3. For each of the following equations, show the appropriate arithmetic and algebraic steps isolating the variable x on the left side of the equation (and so solve the equation).

(a) $2x + 17 - x = 12x - 5$

(b) $\frac{45x}{33} = \frac{9}{11}$

(c) $4x^2 - 6x + 9 = 4(x - 3)(x + 3)$

(Total: 40)